

THE CLAIMS

What is claimed is:

1. In a method of preparing a wafer that has front and back surfaces that are suitable for use in optical, electronic, opto electronic or micro mechanical devices, the improvement which comprises applying a cap layer proximate to at least a portion of the back surface of the wafer to facilitate handling of the wafer while protecting at least the back surface portion from damage.
2. The invention of claim 1, wherein the cap layer is applied proximate to the entire back surface of the wafer and optionally along at least a portion of a side of the wafer that extends between the surfaces to fully protect the back surface of the wafer from damage during handling.
3. The invention of claim 1, which further comprises applying a top layer proximate to at least a portion of the front surface of the wafer.
4. The invention of claim 3, wherein the top layer is applied proximate to the entire front surface of the wafer and optionally along at least a portion of a side of the wafer.
5. The invention of claim 3, wherein the cap layer is applied to the back surface of the wafer before the top layer is applied the front surface of the wafer.
6. The invention of claim 1, wherein the cap layer is applied by at least one of the methods consisting of chemical vapor deposition (CVD), physical vapor deposition, plasma enhanced CVD, low pressure CVD, sputtering and evaporation.
7. The invention of claim 1, which further comprises creating a first functional structure on the front surface of the wafer, wherein the cap layer is applied before the first functional structure is created.
8. The invention of claim 7, which further comprises a creating a second functional structure on the front surface of the wafer, wherein the cap layer is applied after the first functional structure is created, but before the second functional structure is created.

9. The invention of claim 7, wherein the cap layer is applied as first and second sublayers.

10. The invention of claim 9, which further comprises advancing the wafer that includes the sublayers to a location where the functional structure is created on the front surface of the wafer, and then removing at least one of the sublayers before the functional structure is created.

11. The invention of claim 9, which further comprises advancing the wafer that includes the sublayers to a location where the functional structure is created on the front surface of the wafer, and then removing at least one of the sublayers after the functional structure is created.

12. The invention of claim 11 wherein the sublayer is removed by at least one of dry etching, wet etching or polishing.

13. The invention of claim 11, wherein the sub layer is removed by chemical mechanical polishing.

14. The invention of at claim 9, which further comprises applying an etch stop layer as the sublayer that is positioned closer to the wafer.

15. A wafer provided by the invention of claim 1.

16. A wafer that has front and back surfaces that are suitable for use in optical, electronic, opto electronic or micro mechanical devices, and a cap layer proximate to at least a portion of the back surface of the wafer to facilitate handling of the wafer while protecting at least the back surface portion from damage.

17. The wafer of claim 16, wherein the cap layer includes at least two sublayers.

18. The wafer of claim 17, wherein the sublayer that is positioned closer to the wafer comprises an etch stop layer.

19. The wafer of claim 16, wherein the cap layer includes a sublayer having a minimum thickness of about 20 nm.
20. The wafer of claim 19, wherein the sub layer has a thickness of between about 50-1000 nm.
21. The wafer of claim 16, wherein the cap layer includes a material from the group consisting of SiO₂, Si₃N₄ and diamond like carbon.
22. A display device comprising the wafer of claim 15.
23. A display device comprising the wafer of claim 16.
24. A computer system comprising the display device of claim 22.
25. A computer system comprising the display device of claim 23.